

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**HERBACEOUS WIND BARRIERS**

**(feet)**

**CODE 422A**

**DEFINITION**

Herbaceous vegetation established in rows or narrow strips across the prevailing wind direction.

**PURPOSES**

This practice may be applied as part of a conservation management system to support one or more of the following:

- ◆ reduce soil erosion from wind;
- ◆ protect growing crops from damage by wind-borne soil particles;
- ◆ manage snow to increase plant available moisture, and;
- ◆ provide food and cover for wildlife.

**CONDITIONS WHERE PRACTICE  
APPLIES**

This practice applies to cropland, or other land where crops are grown.

**CRITERIA**

**General Criteria Applicable To All Purposes  
Named Above**

**a. Vegetation:**

Barriers may consist of perennial or annual plants. Plant materials shall be selected for the following characteristics:

- ◆ adaptation to the site;
- ◆ erect growth habit;
- ◆ resistance to lodging, and;
- ◆ minimum competition with adjacent crops.

**b. Number of Rows:**

Barriers may consist of one row of plants providing the required porosity can be achieved with a single row and that the row contains no gaps.

Where two or more rows are required to achieve the required porosity and to avoid gaps, the rows shall be spaced no more than 36 inches apart.

**Additional Criteria To Reduce Soil Erosion  
from Wind**

**a. Barrier Height:**

Barriers designed for this purpose shall have a minimum expected height of 1.5 feet during the wind erosion period for which the barriers are designed.

**b. Barrier Porosity:**

Barriers established for this purpose shall be designed to achieve a porosity of 40-50 percent.

**c. Barrier Direction and Spacing:**

When barrier direction deviates from perpendicular to the prevailing wind erosion direction, the spacing between barriers shall be correspondingly reduced.

The *required* spacing between barriers shall be determined along the prevailing wind erosion direction during those periods when wind erosion is expected to occur. Spacing shall not exceed 10 times the expected height of the barrier plus additional *unsheltered distance* permitted by the soil loss tolerance (T), or other planned soil loss objective.

The effective spacing between barriers shall be determined using current approved wind erosion prediction technology. Calculations shall account for the effects of other practices in the conservation management system.

**Additional Criteria To Protect Growing Crops From Damage From Wind-borne Soil Particles**

**a. Barrier Height:**

Barriers designed for this purpose shall have a minimum expected height of 2 feet during those periods when growing crops are susceptible to damage by blowing wind or wind-borne soil particles.

**b. Barrier Porosity:**

Barriers established for this purpose shall be designed to achieve a porosity of 40-50 percent during the period when growing crops are to be protected.

**c. Barrier Direction and Spacing:**

When barrier direction deviates from perpendicular to the prevailing wind erosion direction, the spacing between barriers shall be correspondingly reduced.

The *required* spacing between barriers shall be determined along the prevailing wind erosion direction during those periods when sensitive crops are susceptible to damage by wind-borne soil particles.

Spacing shall not exceed 10 times the expected height of the barrier plus additional *unsheltered distance* permitted by the crop tolerance to wind erosion\* as specified in the *USDA Colorado Erosion Handbook, Procedures and Soil Loss Tables, Seedling Sensitivity to Blowing Soil, August, 1993, or other accepted technical references*.

- \* **Crop tolerance to wind erosion is the maximum rate of soil blowing that crop plants can tolerate without significant damage due to abrasion, burial, or desiccation.**

The spacing between barriers shall be determined using current approved wind erosion prediction technology to estimate wind erosion during specific cropstage periods. Calculations shall account for the effects of other practices in the conservation management system.

**Additional Criteria To Manage Snow To Retain Additional Soil Moisture**

Barriers established for this purpose shall be designed to achieve a porosity of 60-75 percent during periods of expected snow cover.

**Additional Criteria To Provide Food and Cover For Wildlife**

**a. Vegetation:**

Barriers established for this purpose shall consist of plants that provide food and cover for the targeted wildlife species.

**b. Barrier Width:**

Barriers established for this purpose shall have a minimum width of two feet.

**c. Barrier Height:**

Barriers established for this purpose shall have a minimum expected height that provides adequate cover for the targeted wildlife species.

**CONSIDERATIONS**

Transport of wind-borne sediment and sediment-borne contaminants offsite are reduced by this practice when used in a conservation management system.

Herbaceous wind barriers are suitable for use under center pivot irrigation systems.

Spacing between barriers may be adjusted, within the limits of the criteria above, to accommodate widths of farm equipment to minimize partial or incomplete passes.

Selection of plants for use in barriers should favor species or varieties tolerant to herbicides used on adjacent crops.

Plants which may be alternate hosts for pests injurious to adjacent crops should not be selected for use in barriers.

Selection of plant species less palatable to animals may reduce damage to barriers from grazing wildlife.

Where water erosion from melting snow is a concern, *soil movement can be decreased by installation of other* supporting erosion control practices such as residue management. Where feasible, aligning barriers across the slope can enhance moisture infiltration and decrease erosion.

When barriers are designed to enhance wildlife habitat, plant species diversity should be encouraged. The use of evergreens in barriers designed to provide winter cover may increase their value. Barriers that result in multiple structural levels of vegetation within the barrier will maximize wildlife use.

Some plants are damaged by blowing wind as well as by wind-borne soil particles. In such cases, the spacing between wind barriers may have to be reduced from that obtained using wind erosion prediction technology.

## **PLANS AND SPECIFICATIONS**

Specifications for establishment and maintenance of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and Operation & Maintenance described in this standard.

Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

## **OPERATION AND MAINTENANCE**

Annual barriers shall be reestablished each year by planting at recommended dates, leaving rows standing after crop harvest, or leaving standing strips when incorporating a cover crop into the soil.

After establishment, perennial barriers shall be fertilized *as needed to maintain plant vigor, and noxious weeds shall be controlled.*

Harvest of hay or seed from perennial barriers, grazing, or mowing for weed control, shall be managed to allow re-growth to the planned height before periods when wind erosion, crop damage, or drifting snow are expected to occur. Annual barriers may be grazed or harvested after critical periods have passed.

Wind-borne sediment accumulated in barriers shall be removed and distributed over the surface of the field as determined appropriate.

Barriers shall be re-established or relocated as needed.

Barriers designed to enhance wildlife habitat should not be mowed or pruned unless their height or width exceeds that required to achieve the wildlife objective, and they become competitive with the adjoining land use. When mowing or pruning is necessary, it shall be done during the non-nesting season.

## **REFERENCES**

USDA, Soil Conservation Service, Colorado, *Erosion Handbook, Water and Wind, Procedures and Soil Loss Tables*, pg. PRO-C-3, August, 1993.

USDA, Natural Resources Conservation Service, Colorado Field Office Technical Guide, Section I, *Erosion Prediction, Climate Data Index*, March, 1998.

USDA, Natural Resources Conservation Service, Colorado Agronomy Technical Note No. 86, *Small Grain Barrier Strips for Vegetable Crops*, July, 1995.